

DISCLOSURE OF THE ABSTRACT

It is an object of the present invention to reduce the constraint that the density ratio is constant as small as possible, and to obtain high power recovering effect in a wide operation range by using an expander which is operated in accordance with a flowing direction of refrigerant. A determining method of a high pressure of a refrigeration cycle apparatus in which a refrigeration cycle uses carbon dioxide as refrigerant and has a compressor, an outdoor heat exchanger, an expander and an indoor heat exchanger, and the refrigeration cycle including a bypass circuit provided in parallel to said expander, and a control valve which adjusts a flow rate of refrigerant flowing through said bypass circuit, said compressor being driven by power recover by said expander, wherein if an optimal high pressure of a first refrigeration cycle flowing through said expander and a second refrigeration cycle flowing through said bypass circuit is defined as P_h , and a bypass amount ratio flowing through said bypass circuit in said P_h is defined as R_{b0} , and a maximum refrigeration cycle efficiency of said first refrigeration cycle in said P_h is defined as CO_{Pe} , and a maximum refrigeration cycle efficiency of said second refrigeration cycle in said P_h is defined as COP_b , the optimal high pressure P_h which maximizes $(1-R_{b0}) \times CO_{Pe} + R_{b0} \times COP_b$ is determined.